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ERP/SUPPLY CHAIN MANAGEMENT

Blending ERP and Supply Chains

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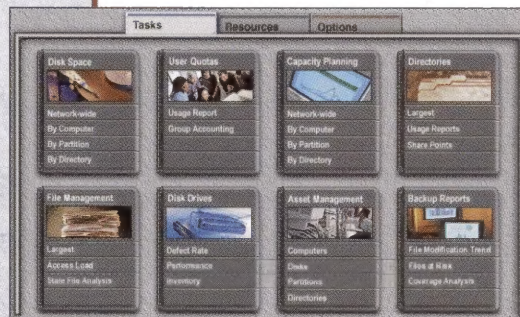
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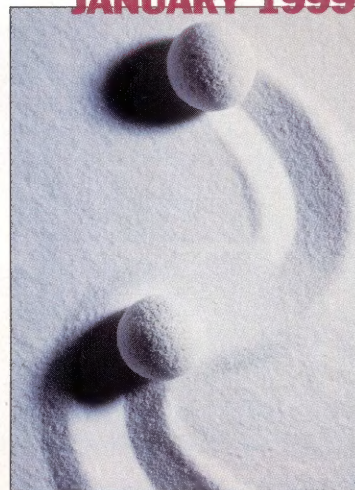
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At one time, ERP consisted of nothing more than independent software modules providing point solutions. But now the stage is set for best of breed ERP solutions. According to one KPMG analyst, evolution is working in favor of both vendors and IT managers. *By the HP Professional Staff*

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Benchmarks come. And benchmarks go. HP, with help from some Supply Chain Management and ERP vendors, has formed alliances that do something about it. *By the HP Professional Staff*

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Call it Extended ERP. Think of it as tempering the supply chain. IT managers in companies of all sizes are uniting Enterprise Resource Planning and Supply Chain Management in ways that are both technically sound and financially safe. *By the HP Professional Staff*

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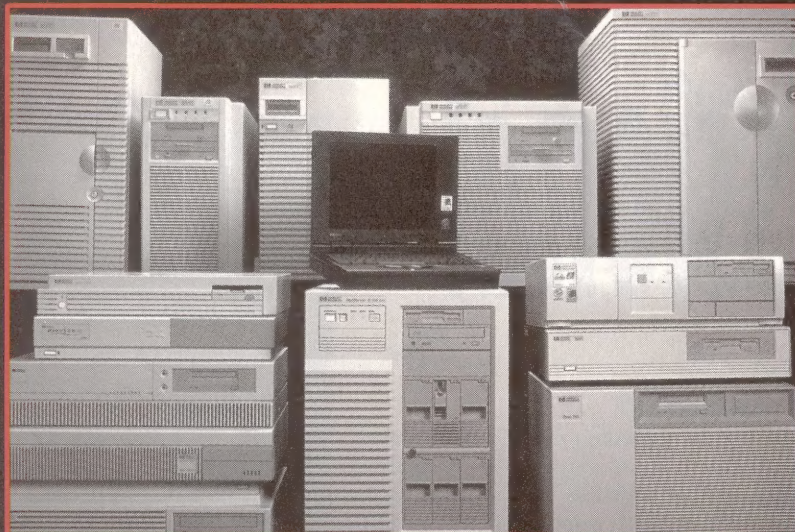
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I Predict There'll Be Lots Of Predictions

Predictions aren't usually my bailiwick. And I loathe; no, I abhor, the preponderance of them from others of my ilk around this time of year. Now, I'm probably not fooling any of you savvy, cynical IT readers out there. I'm sure you're all aware that editorials beginning with that kind of disclaimer, especially in the computer trade press, can only lead to one inescapable conclusion: Get ready to read some self-aggrandizing predictions.

Nevertheless, I'm undaunted (actually, I have no other ideas).

When it comes to products and services, HP will continue to undermarket them. I've seen this over and over again. No one (including competitors) doubts the technological prowess of HP's scientists and engineers. Or the quality or reliability of the products they manufacture. However, HP, never an astute marketer, can't sell them. 100VG-AnyLAN — anyone? Are you familiar with HP's Domain Internet/Web Servers? No? Didn't think so. Sun's the brand name there. IrDA? Errr, no idea, right?

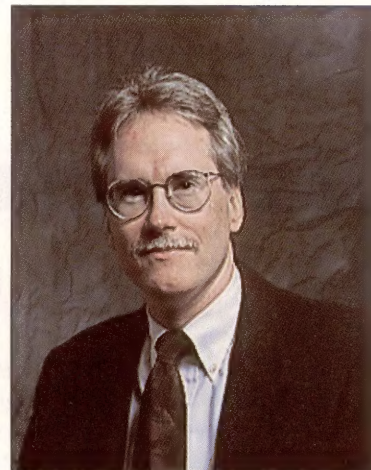
But surely you know, HP's in the E-Commerce biz. What? No e-bells? IBM seems to have the mind share on that one. Graphics-intensive 3D workstations? Surely, you said HP by now. OK, admit it: You were thinking SGI. What about these HP software products? ChangeEngine? OpenPix/ImageIgniter? OpenMail? After Lew Platt ran through an exhaustive list of HP technologies at last year's HP World keynote, one stunned audience member suffering from info overload, summed it up by saying, "I didn't know HP did all that stuff." That's what I call a major disconnect. HP's "build it and they will come" philosophy hasn't brought the kind of market share that's needed to help boost the company's bottom line or create the mind share in new markets against competitors who advertise with reckless abandon.

HP's corporate culture will undergo a fundamental shift to centralization. It's been clear from this past year, that although *The HP Way*, a prime example of decentralization, which has served HP well in the past, just hasn't been as effective lately. High-ranking, long-term GM's Rick Belluzzo and Dick Watts have left the company. And HP is suddenly hiring outside executives to hatch a series of internal "independent startups" rather than promoting from within.

HP's recent reorg of the Computer Organization under the direction of Ann Livermore, began a new centralization for HP this past October. Many diversified business divisions, once seen as the equivalent of medieval fiefdoms, are now under one castle roof. And finally, Lew Platt hired an outside consulting firm to provide a top-to-bottom (and sideways) evaluation of the organization, fueling rumors of lay-offs (which would be a first for HP) or spin-offs of its analytical or measurement divisions (which isn't really likely).

Merced (IA-64) will be a debacle for HP. And a lukewarm winner for Intel. HP, effectively muzzled by agreements with its design partner Intel, hasn't done much to communicate the benefits (see first prediction above) of its pretentiously named Explicitly Parallel Instruction Computing (EPIC) architecture. Merced, the first implementation of IA-64/EPIC has been delayed. So what else is new? HP's focus is now shifting towards McKinley, the code name for the next IA-64 implementation. In the meantime, HP is now talking about more generations of its PA-RISC CPU. The parallel implementations have always been part of HP's strategic plan, but it's confusing for HP customers.

Even more confusing, is that while Intel's IA-64 gurus are beating the drum for a level playing field, HP execs are claiming its working knowledge of the architecture give it an edge over competitors. It's "best compiler" strategy is an esoteric approach, but HP hasn't educated its customers (see first prediction again) so far.



"Move over Kreskin."

The HP 3000 will be the technological surprise of 1999. It's a 27-year-old technology. That alone is surprising. But while the HP3K gets the trickle down benefits of HP's PA-RISC CPUs, it also gets the proven reliability of MPE/iX — now at 6.0. OK, HP3K boxes are being dumped because some third-party vendor's aren't Y2K-compliant. But the HP 3000 has found new life in the niches. As problems with the reliability and availability of UNIX and the lack of scalability of Microsoft Windows 2000 become evident, the case for the POSIX-compliant HP3K begins to look better than ever.

OK. At least I didn't mention Y2K. Java. Or the DOJ. But now that you've read my predictions, I'm sure that you have some of your own. So, send them to me at hppredictions@hpro.com. I predict we'll print the best replies.

George A. Thompson
thompsonga@hpro.com

mail bonding

FRED MALLET IGNITES THE HP-UX SYS ADMIN MASSES

I want to thank you for the excellent articles you've written about Ignite-UX. I've contacted the publisher and received permission to include these articles on our Web page. If my team could help you in any way with these articles, do not hesitate to contact me. You made my day!

Steve Bennett
HP Unix Development Lab
Ignite-UX/Recovery Project Mgr.

I just made the output of `print_manifest` available to our management via the Web. I also enjoyed your `regexp` series. I learned a lot from it, and it has drastically improved my shell scripting. Keep up the good work!

Chris Ballard
Systems Administrator

I am the Senior UNIX Admin of a small company which uses a part of Ignite a little differently. We only have eight UNIX servers ranging from a D-350 to T-500. We recently started utilizing only the "Make Recovery" part of Ignite.

Since our servers are centrally located and vary greatly we really don't have much of conventional use for Ignite. However, we installed just

the filesets used for the make recovery tape, much smaller than total Ignite and my vacations are a little less tense. I have not actually used one of the tapes for a root disk restore but I feel much better having them.

Gerald Jones
The Jockey Club

Just finished reading your article on Ignite in the August issue of HP Professional. I would like to see more, in-depth coverage of this app.

Terry Siegersma
ADC Telecommunications

I would like to know if HP will ever give us the ability to expand any filesystem and device swap on the fly like AIX and DG-UX. I work with multiple UNIX platforms and really find a huge shortcoming from HP's side when it comes to LVM.

Blake Bathory
Unix Systems Administrator
Integrated Medical Networks

I've heard about Ignite/UX before, but your explanation of it was excellent. Great article and it couldn't have come at a better time for me. I am

starting a new job as Sys Admin and during my interview I was shown a room packed full of new HP workstations.

Needless to say my first assignment will be to get them up and productive, fast. I thought I had only two alternatives: backup the old system and restore on the new workstation or cold install and copy all configuration files with scripts. Now it looks like I have a third way.

Bruce Ballie

Great paper on Ignite! I'm fired up and want to read more. Keep the articles coming.

Joe Winiewicz
Network Administrator
Rich Products Corporation

Because of the overwhelming demand, the Ignite/UX series continues (as it has since this past August). This month's installment is on page 28.

George A. Thompson
Editor-in-Chief

Is Being Certifiable Sheer Madness?

Let's face the facts: technical managers don't have the time to train their employees adequately.

It was the summer of 1985. I just finished my degree in Computer Science. And I accepted a job as a UNIX System Administrator at a hardware R&D lab for the Burroughs Corporation in San Diego, Calif. My college curriculum had many practical application courses like hardware design, programming languages, operating systems and compilers. My programming work was done on a UNIX server using C as the primary programming language.

In one of my last courses, I wrote an operating system modeled after UNIX. So, I was confident that with my college education, I was ready for my new job. But even after all of this preparation, I was still not as ready as I thought. My new job as a UNIX SysAdmin was a bit overwhelming, because most employees used the UNIX server for all of their computing needs. If the system went down or data was lost, it could significantly affect the output of the whole division.

TAKE THE TIME TO TRAIN

Fortunately, after a few months on the job, my boss sent me to a weeklong UNIX System Administration course. I had been exposed to some of the concepts taught both in school and at work, but because the course went through basic UNIX system administration logically, with hands-on examples (that wouldn't cause problems on a live machine), it was much easier to learn.

Luckily, I had a great boss who spent a lot of time training me on my new system administration responsibilities. Still many other IT professionals look to vendors like HP to help provide adequate technical training for their employees. With that in mind, HP designed its *HP Certified* program to create a high level of technical competency among IT professionals. So, if you're one of the HP customers who responded in a recent survey that HP needed a HP-UX certification program and would consider such a program a career booster, then pay attention.

HP has developed certification paths based on job roles in complex environments, not on specific products or technologies. Guiding the implementation of the *HP Certified* program is the customer imperative that professional certification can be an advantage for both employees and employers.

CERTIFIABLE BENEFITS

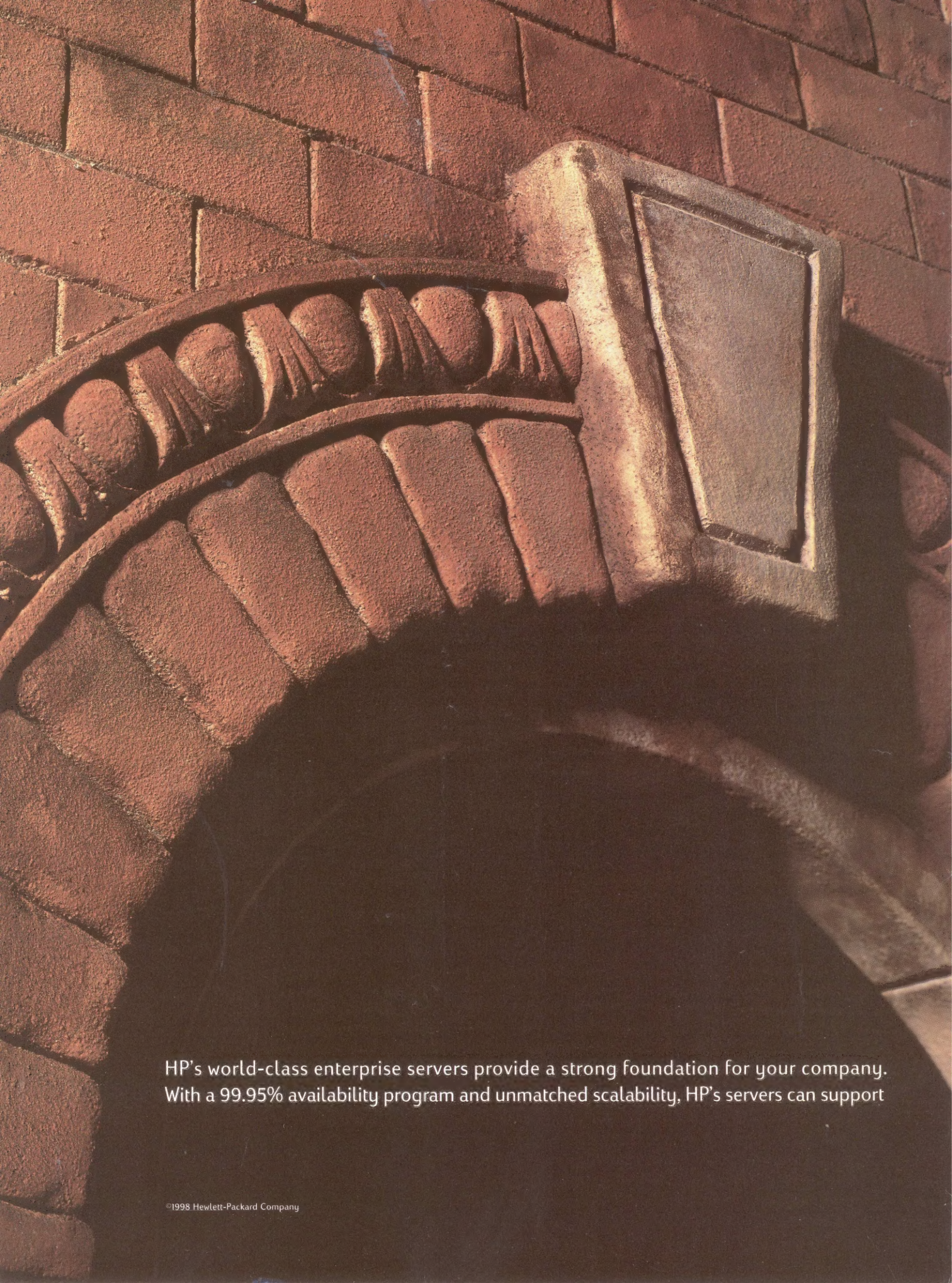
Certification benefits employers through improved technical service quality; increased user satisfaction through enhanced technical support; greater staff productivity; heightened staff quality; lower operating costs through technical efficiency; and better technical reputation.

Certification benefits employees through career advancement opportunities; technical credibility; greater job satisfaction with increased technical competency; opportunities for continued technical education; better technical problem-solving skills; and potential for higher pay and marketability. When working with HP Education to develop and launch the new certification project, the goal was to design an industry-leading program consisting of two tiers: *HP Certified IT Professional* and *HP Certified Advanced IT Professional*.

Within each tier are several planned certification tracks for HP-UX and OpenView/Information Technology Service Management (ITSM). The first track, *HP Certified IT Professional for HP-UX System Administration* will be launched this month. For more information on the new certification program, visit the *HP Certified* Web site at www.hp.com/education/certification.



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HP In The Glass House?

Move over MVS. HP-UX is moving in.

"We're making the HP 9000 environment look like MVS...without all the problems that come [with it]. It's the second attack on the mainframe."

— Nick Earle, vice president and marketing manager for HP's Enterprise Computing Solutions Organization

That statement, made by a feisty Nick Earle, during an interview at last year's HP World in San Diego (see *HP Professional* November 1998), positions HP for battle in the glass house. But a larger question remains: Is there really a war for data center supremacy being waged by HP and IBM in the hearts and minds of mainframe loyalists or is it more like detente for UNIX vendors?

"The diehards who have remained on mainframes are those who find that mainframes truly have some robust bulletproof characteristics that UNIX systems can't really dupli-

cate," says Rich Partridge, senior research analyst for platform and performance, at market research firm D.H. Brown Associates Inc. (Port Chester, N.Y.).

While there may be some fight-to-the-last-mainframe outposts still out there, the co-existence trend may be inescapable. "Microsoft and Intel are trying to push Intel-based servers. UNIX vendors are trying to push UNIX to people who have gotten away from the thinking of [only having] mainframes in the data center. And NT's not an option; so, of course that leaves UNIX," says Joyce Becknell, director of UNIX marketing for The Aberdeen Group (Boston, Mass.).

In the past, UNIX vendors, and HP in particular, have described themselves as mainframe alternatives. "While this is an attack on the data center, I believe that [UNIX] will be more successful at surrounding mainframes in offloading some functions like decision support and data

warehousing rather than replacing mainframes that are doing online production, mission-critical work," says Partridge. But he does give HP some credit for taking enterprise functions and putting them on [HP] platform. However, he says, "HP is not the death knell for mainframes. While HP marketing slogans get attention by saying mainframes are dead, the real opportunity is to do the new growing applications like decision support and data mining ... that could be put on systems of the V performance class."

BATTLE LOYAL

And that may not be a bad thing, he adds, considering the acreage of business LAN-scape to be won. "In reality, [HP is] going to find a lot of business at the high end. Clearly, that's what Sun has done with the [Enterprise] 10000. They had a few slogans right away when they launched it with full-page ads about the frontal

attack on the mainframe." That tactic of frontal assault quickly became one of attrition as they "... maneuvered themselves with the 10000 into a position that it's not displacing the mainframe, as much as absorbing new growth in the enterprise."

"One of the problems ongoing is that there are so few truly enterprise [UNIX] applications, it's still very difficult to unite a system to get full strength," says Becknell. "Users are always looking for more power. So you have all the UNIX vendors tripping over each other trying to figure out how to win customer loyalty and build their product set."

As to the combatants in the war to break through the walls of the glass house, it still boils down to HP, Sun and IBM — with no clear-cut leader. As far as HP is concerned, Becknell is cautious. "They've got a good name. And they're trusted by IS and people are happy with them. So that's the

strength they can leverage into the high-end data center," she says. But HP has never been a strong software player. [They've] always had the most tenuous relationships with software partners."

The old adage about users buying the software first then selecting the hardware to match is true, Becknell says. For that reason, while HP should continue to score big with its traditional customer base, without stronger ISV relationships, winning new business may be tough. "You really need to connect with [ISVs] and provide a total solution and you need to be thoroughly in bed with them," she says. "I'm always going to look to HP to show me how solid those relation-

ships really are."

Becknell sees the V2500 and the related enhancements as important weapons for HP going forward. "The [V2500] preliminary numbers I've seen are certainly impressive. It's definitely fast," she says. "And, they're also working to bring in the [enterprise] services like ContinentalCluster, disaster recovery and backup. And of course, they've really committed to the five 9's strategy," of 99.999% percent uptime.

While performance numbers and benchmark tests aren't everything in a competitive market, customers still look for a certain minimum and a certain level of capability. "IBM wins on their services and they win because

people already think of them as a data center [vendor]. The RS/6000 is popular and they have the System 390," she says. "However, the problem with the RS/6000 is, you can't name the last time it won a benchmark. So, if you're [comparing the] RS/6000 versus the HP 9000 or the Enterprise 10000 from Sun, then the RS/6000 becomes a little bit shakier."

While benchmark performance may be the bullet that chips some glass, it's enterprise applications and services that will shatter the glass house door. While IBM wins the data center name-recognition factor, HP's loyalty to both its users and platforms are important points in its favor. "You're seeing

[HP] make a commitment to their customers and make a commitment to their products. I think HP has made very clear that they're committed to HP-UX and PA-RISC at least through 2002 or 2003, and of course beyond that is anybody's guess for any processor," says Becknell. Still she thinks, "the only supplier of systems who's good with software is IBM. None of the rest are software companies. And, HP has good service but it's nowhere as good as IBM."

But in her mind at least, there remains a litany of ubiquitous questions about IBM: "I'm not sure I understand IBM's commitment. What they're doing with the processor and what they're doing with AIX and why they haven't committed AIX to Merced and now they're going to rewrite it with SCO."

Partridge generally agrees with that view, but raises Compaq as an off-in-the-distance but gaining competitor. "Competitors tried to paint Compaq as buying Digital for the services arm and then kill off the rest of the business," he says. "Clearly, they intend to continue to work on Digital UNIX and the Alpha server."

As the industry accelerated its UNIX development cycle pace, Digital lagged behind because engineers kept looking over their shoulders to see where the axe was going to fall next with layoffs. But, now emerging from what Partridge called the "quiet time" since the take-over, he predicts, "Compaq will fund Digital's catch-up and Compaq bought them because they want to be in the high-end."

—Ken Deats,
Associate Editor

Operating System Scorecard

Source: D.H. Brown



Every year, technology assessment firm D.H. Brown Associates completes its Operating System Scorecard report which compares features and functionality of popular UNIX variants.

"Historically, HP-UX has never really been at the top of our list," says Tony Iams, the D.H. Brown senior analyst responsible for compiling the score. "HP tends to innovate in other areas like stability and investment protection, not necessarily in OS features and functions."

This year, however, HP-UX dropped, according to Iams, due to its slippage in PC client support, distributed enterprise services and its failure to ship promised Java-based system management tools. "In 1998, we found out that HP did not, in fact, ship the Java-based system management tool, a key feature for enabling PC interoperability. That resulted in some slippage for HP in this year's study."

The full .pdf version of the report with a complete description of methodology and detailed feature analysis is available for download at www.dhbrown.com/pdfs/losscorecard.html.

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Business managers working with supply-chain applications know the benefits to be derived from the system can be limited if users have difficulty making sense of the data.

"What really matters to get results," says Jane Hoffer, President and CEO of Prescient Systems, Inc. (Ft. Washington, Pa.), "is how people utilize the application." With major competitors like i2, Manugistics and Logility, Hoffer says that, in order to differentiate itself, Prescient shifted its focus from supply-chain algorithms and towards increasing data visibility across the environment.

Prescient XE 2.0 is a knowledge-based supply chain solution specifically designed to manage variability and uncertainty. Its

Knowledge Foundation module allows users to customize their own "electronic notebook" to contain information about their supply chain operations.

A typical supply-chain operation is bombarded with a wealth of internal and external information. The problem is to capture and retain that data in a usable format. The Knowledge Foundation creates a repository that stores data, Web pages and reports as data elements. That repository feeds XE's Demand Planning, Advanced Planning, Advanced Scheduling and Distribution Planning modules.

Hoffer also describes an operation where Prescient XE can scan a data source: such as an EDI feed or a partner's Web site; search for key words, store the data location or the Web link and e-mail a message to the appropriate personnel.

According to Hoffer, a typical installation takes three to six months and "our total cost of ownership is significantly less." She adds that with a "very object-oriented" approach, there is "no integration complexity of companies like i2."

Coast Distributors, a distributor of recreational vehicle and marine parts in

Costa Mesa, Calif. recently installed a financial application from Lawson Software and Prescient XE for demand planning and forecasting.


Don Ploof, an independent consultant hired for the implementation says most ERP products "make no claims of being forecasting or modeling" tools and don't handle the "technospeak of analysis and smoothing."

The Lawson suite "hands off to the Prescient forecasting module data about products in quantity or out of quantity." Prescient then massages that data with what it already knows about the operation and its partners and feeds it back to organize purchase orders.

Ploof says his initial experience with integrating the AS/400-based Lawson application and Prescient XE on a HP NetServer has gone smoothly. "The Prescient people have been helpful and the software has helped give the Coast people much more knowledge about their [product] usage and forecasting."

*Ken Deats,
Associate Editor*

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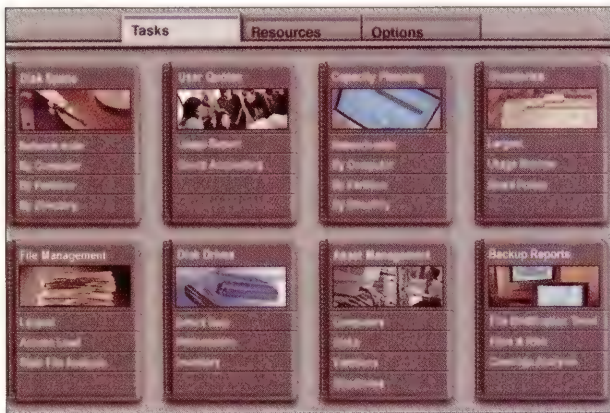


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A cottage-industry has grown up around monitoring and managing storage, or DASD, in the traditional data center environment. The same ability to see and understand distributed storage, up to now, has been at best an inexact science. That's the niche HighGround Systems (Marlborough, Mass.) wants to fill with its Storage Resource Manager 3.0 Enterprise Edition (SRM).

SRM is a Web-based tool for centrally monitoring the availability, use and performance of Windows NT and Microsoft BackOffice storage. It monitors every file, directory, share point and partition in NT environments.

Asked to compare SRM 3.0 to competitors, Tom Rose, HighGround's vice president of Marketing, lists

SpaceView/DS from Boole and Babbage (San Jose, Calif.) and SAMS:Vantage for Distributed Platforms from Sterling Software (Sacramento, Calif.). Of those, SRM is "the only Web-based, the only fully NT-based and we use standard in-the-box tools like Internet Explorer and Netscape," he says.

Rose also commented on SRM's use of SQL Server as a data repository where others rely on flat files, which "makes it hard to run standard reports like [Seagate's] Crystal Reports. Most of our large customers were waiting for SQL support," he adds. That gives them the ability to store as much as one full year of historical data and provide a "storage audit for [Storage Area Network] planning and server consolidation" projects.

Rose lists the scalability that SQL offers, the ability to drill down to individual shares and directories, auto discovery, report filters and threshold settings as added features in SRM 3.0.

Rose says that there will be added support for application-specific storage (Microsoft Exchange will be first) and UNIX agents for cross-platform storage management (HP-UX and Solaris, initially).

Located in Des Plaines, Ill., Geneer is a custom software house that supports over 30 NT servers. "We were HighGround's first paying customers," says Andrew Hargreave, the director of Geneer's Technical Infrastructure Department. "SRM has saved us from having to hire an additional network administrator."

Hargreave explains that, "in the blink of an eye, developers copy their entire hard disk on to the network." His staff had to keep track of who was using what storage and "track that back to their department heads." SRM gives Hargreave the ability to send a message and threshold screen shot to managers.

Hargreave plans to use SRM, Crystal Reports and a customized formula to bill back to business units, "so they can pay for their storage usage."

Asked what he would like to see in the future, Hargreave mentions agents for Storage Area Network and Network Attached Storage devices. But notes that it is an industry-wide shortcoming. "Nobody's doing that yet."

*Ken Deats,
Associate Editor*

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Forging New Supply Chains With ERP

What's Next in the Evolution of Enterprise Resource Planning?

MANUFACTURING managers once had to be experts at Capacity Planning, then Materials Requirements Planning. With the advent of end-to-end supply-chain management, is Extended Enterprise Resource Planning the next stage?

HP Professional Staff

Fifteen to twenty years ago, the name of the manufacturing game was capacity planning, now known as Materials Requirements Planning (MRP). What manufacturers needed then was a methodology for gauging the arrival of materials to their manufacturing sites.

MRP developed as manufacturers recognized that these processes were influenced by factors such as labor and financial assets. "The focus of these early solutions was on specific function and assignment completion. All of which led to functional 'silos'," says Jan Willems, KPMG Management Consulting N.V. (Amsterdam, Holland).

MRP has rapidly evolved into Manufacturing Resource Planning (MRP II), Just In Time (JIT) invento-



ry control and other logistics planning tools. These tools include financial analysis and reporting, demand forecasting, sales force automation and tracking, human resources, materials planning, production and the building of enterprise systems around the paramount needs of manufacturing and customer services.

"The mission of MRP solutions shifted somewhere along the way as providers watched their clients' business models change from hierarchical, financially-oriented activities to encompass whole enterprise process models," observes Markus Berber, HP's applications marketing manager for the Internet Applications Services Division (IASD). "Users were looking for process-specific packages that effectively closed the gap between existing information systems and business processes that were also evolving. They wanted to overcome the limitations of traditional con-

straint-based planning and do much more 'what-if?' scenario-based analyses leading to specific business decisions."

This was the plan for what's become known as Extended Enterprise Resource Planning (ERP). "Because customers needing to combine outcomes of process reengineering with prior downsizing, or even upsizing through acquisitions, were effectively demanding much more from their solution providers," says Berber. For example, ERP product suites now include important provisions for integration of industry- or process-specific applications from third-party vendors.

Collectively, these developments from providers further boost the aims of ERP and Supply Chain Management (SCM)-enabled companies that want to integrate highly specialized, packaged applications using advanced planning, forecasting and

other industry-specific supply-chain activities. "One sees these differences between Stage 1 and Stage 2, where IT uses solutions to integrate many more business functions," points out Willems. Enhancing manufacturing processes which directly enhance many customer services, the step between Stage 1 and 2, creates a stronger flow from design to sales. Many ERP vendors have already integrated these basic processes into their software.

BENDING AND BLENDING

But customers care about product, price, quality and availability...*not* about the manufacturer's problems and processes. In Stage 3, the manufacturer's mindset is fundamentally changed and looks at processes from the customer's point of view, which casts a very different perspective on planning and supply chain management. These forces are now affecting the latest stage of progress in supply chain evolution — blended solutions.

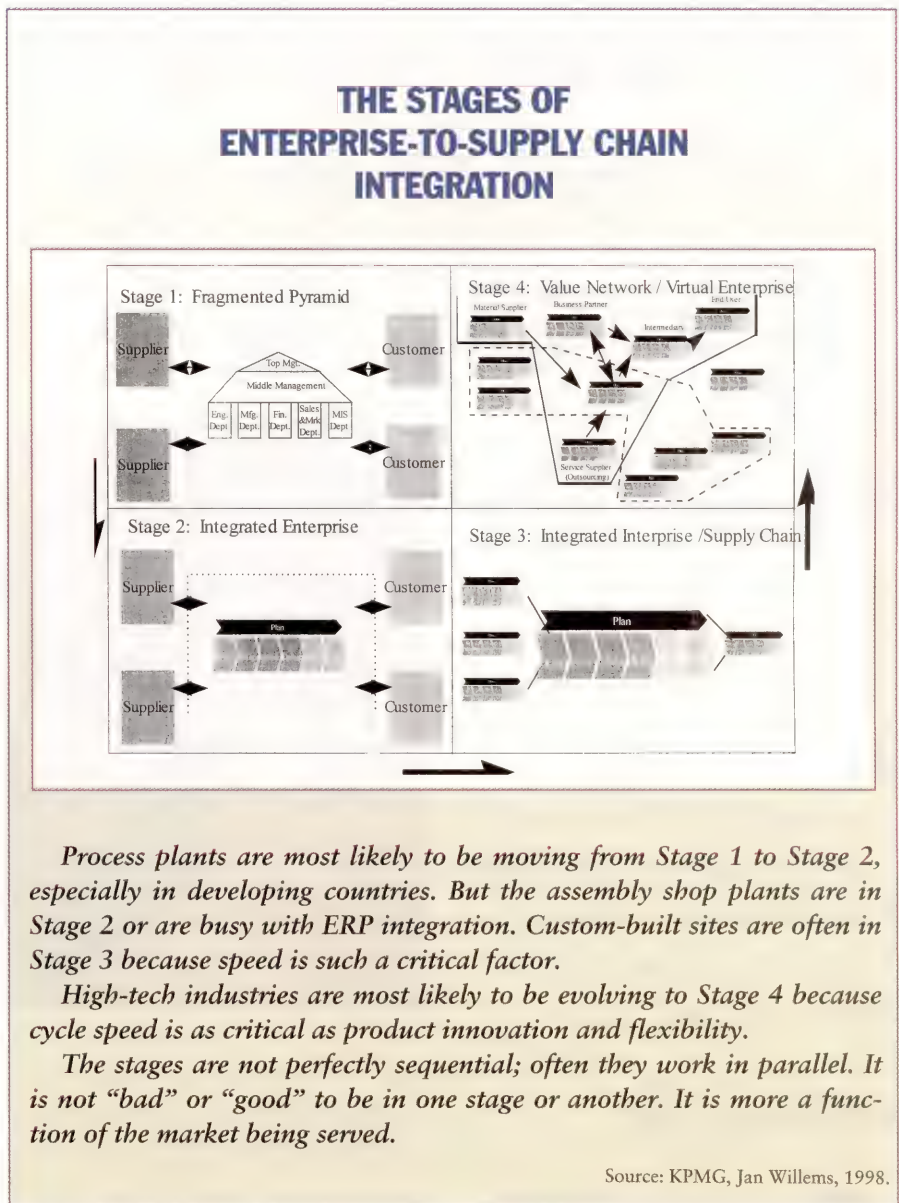
In Stage 4, teams and alliances of vendors collaborate to integrate supply chain capabilities throughout the ERP system, creating a "value network or virtual enterprise." The fact that most Fortune 500 companies are ERP-enabled fuels dramatic progress in supply chain integration. "Interestingly, some manufacturers conducting [Business Process Re-Engineering] site-by-site find different sites are in different stages," notes Willems.

ERP SPECIALIZATION

Today, the segmentation of ERP-related software vendors can be divided into several highly specialized areas:

- Enterprise Resource Planning (ERP)
- Advanced Planning & Scheduling (APS)
- Manufacturing Execution Systems (MES)
- Warehouse Management Systems (WMS)

And there are nearly 100 enabling technology vendors and as many sup-



porting consultants, listed by the Supply-Chain Council (Pittsburgh, Pa.). Founded in 1996, the Supply-Chain Council promotes progress and best practices among corporations' supply-chains involved in purchasing, logistics, supplier management, customer service, business process reengineering and information technology. More than a dozen are specializing in supply-chain innovation.

This approach is in stark contrast to the "band-aid" solutions that Berber describes as identifying isolat-

ed problems and attempting to solve them all with single, point-solutions. Such software is often short-lived, he says, because seemingly isolated problems are later found to be not so isolated after all. So, their success will be quite limited.

Therefore, if you haven't kept track of the changes and improvements in Extended ERP and SCM, you might be overlooking a competitive advantage. ♦

Building A Better ERP/SCM Benchmark

HP, ERP And Supply Chain Partners Prove The Validity Of Their Solutions

IT MANAGERS KNOW that Supply Chain Management is easier said than done. And having a standard performance benchmark would make life easier too. That's why HP and its ERP and SCM partners have been working overtime in the HP Development Alliances Lab. The results speak for themselves.



HP Professional Staff

Supply-chain Optimization. Decision Support. Sales Tracking And Forecasting. These solutions, as they have been implemented within corporate enterprises, have influenced a change in how ISVs work with HP. Consequently, HP has formed alliances with supply-chain solution providers: i2 Technologies, Manugistics, Numetrix, Logility, Paragon and SynQuest as well as ERP vendors Baan, J.D. Edwards, Oracle, PeopleSoft, QAD and SAP.

These alliances enable teams from HP and its partners to convene at HP's Development Alliances Lab in

Cupertino, Calif. and develop benchmarks that are important for providing assessments of performance in supply-chain applications. These benchmarks are unique in that they represent a bona fide, complex supply-chain and incorporate sizable bill-of-material data models.

BENCH PRESS

This is a significant improvement because the HP benchmarks do not rely on smaller databases that necessitate extrapolations of performance. "IT managers see an increasing number of instances and transactions per second running across internal company boundaries and wonder about the overall effectiveness and integration of the solution," explains

Christine Fronczak, HP's Supply-Chain Alliance marketing manager. "Serious collaborative programs in which software solution providers work with HP to develop new ways of pleasing application users earn their attention."

Results of the HP/vendor benchmarks, as they are completed and announced, establish performance standards for corporate IT planners in various process-specific categories that have not been accurately gauged before: regenerative, optimized planning; available to promise (ATP) response time; and Internet-based collaboration response time.

"It's the nature of supply-chain solutions to be CPU-intensive," notes Fronczak. But it's just one reason the

server is a linchpin. "There may be hundreds, upwards to thousands of users in a client-server environment. And all users gauge server response time each time they run various applications or modules."

A RISING STAR

Consider the situation of EchoStar Communications (Littleton, Colo.): Just two years ago, its vertically aligned solutions for engineering, manufacturing, distribution and financial applications crashed daily, forcing users to develop their own work-around methods. EchoStar placed a high priority on a cohesive information architecture that became a major cooperative effort between EchoStar, HP, Oracle and consultant groups (see *IT=Inspiring Teamwork And Technology*, HP Professional, November 1998).

Within the framework, EchoStar encapsulated entire Oracle applications, including the Financials modules. Collectively, these comprise a stable enterprise solution, spread across nearly two dozen HP 9000 D- and K-class servers and 45 HP NetServers, effectively supporting over 4,000 nodes in the U.S. and Europe.

In May 1997, EchoStar overhauled its distribution processes for hardware products and significantly expanded its customer service center, thus illustrating another point about the new supply-chain environment: It's feasible to keep on making things better, adding new point applications as managers tackle subsequent process bottlenecks. The new system provides automatic calculation of sales incentives and commission payments to dealers and distributors so efficiently that it's now possible to cut more than 10,000 checks per month where previously, only 2,000 per month was feasible. The Oracle-based system also improves dealer statements by providing a secure Web-based application to handle dealer and distributor queries for payment and accrual information.

Smaller companies, too, are open-

ing up supply-chain bottlenecks through extended ERP solutions (see *Good ERP Comes In Small Packages*, HP Professional, November 1998). Digital Computer Integration Corporation (DCI; Plano, Texas) recently completed its deployment of Baan's integrated "solutionware" for manufacturing, distribution, finance

and enterprise management. Using a realistic budget in dollars and manpower for this small, \$20 million company, DCI completed its deployment in just 11 weeks.

This rapid deployment of the Machine Building Industry solution on a HP LX Pro NetServer was essential for fixing process bottlenecks and

NEW LINKS FOR ERP SUCCESS

When solution providers enlist with other vendors of enabling technologies, IT executives see a chain reaction and positive trends:

- Creation of effective, working alliances among software and server providers, consultants and user groups promotes far greater integration of solution components than was previously possible.
- The stage is set for surprise-free deployment of solutions; HP and vendors providing certified server/software solutions, i.e., the configuration is pre-packaged, tested and ready-to-run.
- Development of realistic SCM-specific benchmarks. Working with HP's Development Alliances Lab teams the servers and HP-UX operating system are tuned, solutions made more "bullet-proof," all leading to optimum performance and reliability.
- Solutions code supports server scalability, can take maximum advantage of main memory and additional CPUs as number of concurrent users increases.
- Greater ability to integrate legacy data resources and third party database applications. Applications are available that meet industry-specific needs.
- Streamlined development methods, availability of industry templates, custom configuring is not the problem it once was and deployments are made on-time, in-budget. Applications are easier to tune and squeeze out bottlenecks.
- Executive forums, user groups, large pool of consultants, university research groups (leveraging the emergent Alliances) build user proficiency.
- Pushes ERP/SCM to wider circles of users. The integration of these SCM solutions with popular PC applications such as MS Excel affords benefits for less sophisticated users.
- Respective sales teams, both HP and the software solution provider now have a repertoire of best-practices learned from Business Process Reengineering of early adopters. Many of these best practices are built into software tools for designing/optimizing the supply-chain, even for industry-specific process requirements through use of templates.

Y2K issues throughout the company. DCI was, in fact, the pilot site for this specialized solution that's enabling Baan to reach into small- and medium-sized companies. The solution is ready to run, incorporating pre-configured business process templates tailored to specific vertical industries.

Oracle, Baan and other extended ERP solutions such as those from J.D. Edwards, PeopleSoft, QAD, Lawson and SAP are comprised of a dozen or so modules. These modules encompass processes from database, general ledger, accounts payable, assets, accounts receivable, order entry, purchasing, inventory management and scheduling, the sum of which is designed to facilitate the highest levels of data resource usage.

ERP vendors extended their solutions with supply-chain capability by developing integrated modules, or through acquisitions. ERP vendor

PeopleSoft, for example, acquired Red Pepper for planning and optimization products. Baan acquired Berclain, for special purpose supply and demand tools that extend its Baan IV solution suite. Oracle has partnered with IMI and Manugistics to develop Oracle CPG, an integrated solution for the consumer product goods industry.

FUTURE STOCK

The HP/vendor lab teamwork also applies to future activities. It will benefit corporate IT groups who can use benchmark data to build capacity planning models to enable accurate prediction of performance on new HP 9000 servers. They can answer questions related to how changes in application load parameters (i.e. number of SKUs, length of nightly batch window) will affect throughput, timing of nightly runs and ability to handle periodic load increases, or determine

how changes to the platform environment (i.e., number of CPUs, amount of RAM) will affect SCM application performance.

The hallmark of today's network-minded IT community is the flourishing educational activity of software and server or platform providers, consultants, universities, user groups and executive forums all working to promote user productivity and proficiency. Customizing packaged ERP applications with user interfaces for company-specific purposes is not nearly the time-consuming, expensive process it once was.

Providers offer suites of tools for loading/integrating data from proprietary databases into new systems as well as programs attuned to the needs of small- to medium-sized companies. They're also setting the stage for e-commerce transactions. ♦



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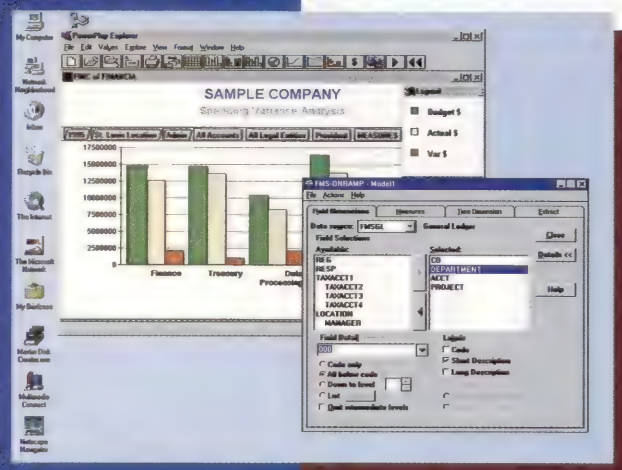
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Integrating Supply Chain Management & ERP



IT provides the vital connection between Supply Chain Management (SCM) and process-oriented Enterprise Resource Planning (ERP) tools. The SCM/ERP pairing is a critical combination, paving the way for the virtual enterprise networks now emerging. It bridges traditional, transactional ERP systems, legacy systems and adds levels of decision-support intelligence and planning engines.

Thus, SCM system users control the ERP systems. For example, almost any overnight trip you take these days puts you in contact with one SCM solution developed by Jasper Furniture Company (Jasper, Indiana).

THE RHYTHM METHOD

As a custom-designed furniture manufacturer for hotels and motels, Jasper's armoires and desks grace the

hotels of the Kimball Lodging Group. Yet it experienced the classic symptoms of a pre-existing business system being pressed beyond its limits. But Jasper's IT team was clear about the solution: The software solution Jasper envisioned with i2 Technologies' (Irving, Texas) Rhythm was first

intended to supplement Jasper's Avalon ERP RDBMS, adding specific capabilities such as checking the validity of delivery dates and enabling scheduling personnel to see the effect of order changes.

The goal was expanded to support general needs for advanced scheduling, demand planning, manufacturing planning and order promising. Jasper's IT Group saw Rhythm as a

HP Professional Staff

CPU engine that could simultaneously evaluate the effect of customer changes to materials and manufacturing capacity, then produce reports in time to successfully execute revised plans. In this operational concept, it's the blending of servers with the solution components, Rhythm and the Avalon ERP system, that's key to fully optimized manufacturing and business profitability.

The new supply chain solution supported a 26% increase in sales without subsequent increases to staffing. Work-in-progress and raw materials were reduced by 33%. The HP and i2 Rhythm-based solution replaced mainframe technology with a HP 9000 K420 server that has since been upgraded to a 4-way, HP K450.

COOKIE MONSTERS

Grupo Gamesa (Monterrey, Mexico), a subsidiary of the PepsiCo Company, is Mexico's leading producer of cookies and crackers. With sales of more than \$500 million operating from six plants, 12 distribution centers, 96 local warehouses and with more than 10,000 employees, Gamesa recently completed a reengineering around Rhythm. Aimed at reducing the planning cycle time from four to 1.5 days and doubling the performance of customer services. The company makes and distributes more than 250 SKUs representing over 40 brands that entail more than 1,000 product changes and new product launches annually — necessitating a complex manufacturing and distribution environment.

"The company's objectives were quite consistent and representative of the consumer products industry," says Steve Weller, European Industry marketing director for i2 Technologies. "Gamesa's managers also clearly understood the importance of investigating opportunities for optimizing the size of its inventory, hastening delivery to assure product freshness and using IT for supporting product innovation. In addition, Gamesa aimed to solve slow and often complex promotion coordination processes, improve forecasting and deal with network management issues."

Gamesa markets products to more than 5,000 point-of-sale locations throughout Mexico and exports products to the U.S. and Central America. This dispersed market and wide product variety presented a growing challenge in an atmosphere of high inflation and low product margins.

"One reason that Group Gamesa has been so successful at their reengineering," explains Weller, "is that the logistics team realized that competition for them is no longer between companies. Instead they see true competition as being between supply chains. As such, they aimed to

enhance data resources and streamline data being used throughout the entire extended enterprise."

The team also acted quickly. They implemented key Rhythm Factory Planner functionality in eight weeks across the entire network of six manufacturing plants, improving on early estimates that it might take 12 weeks to make a deployment at one plant.

From Rhythm Factory Planner, managers can create material and capacity-feasible plans for manufacturing operations. This facilitates process coordination from packaging material deliveries from suppliers to

WAXING PHILOSOPHICAL ABOUT SCM

IT managers are finding that successful SCM isn't so much a business reengineering project as it is a philosophy. Beyond enabling the timely and cost-effective movement of goods through the pipeline, SCM implementations can now be entirely customer-driven and grounded in communicating customer demand back to the supplier. The most effective SCM solutions combine a well-thought supply-chain strategy, which supports the corporation's high-level business strategy and corresponding business process reengineering with a select portfolio of enabling applications and the distributed IT infrastructure.

By addressing the mission-critical functions within the manufacturing enterprise and outside the firm, including suppliers, partners and customers, companies build efficient and secure customer-centric productivity networks that were not previously feasible. SCM is a potent tool because of the seamless structure it affords for supporting globally dispersed operations and different competencies. It functions as a coherent, customer-satisfying tool whose boundaries appear invisible to the customer.

Advances in information technology make it a straightforward process for companies to develop and cost-effectively maintain an agile organization, one that responds quickly to changing demands and conditions. This is accomplished, in part, by optimizing the core competencies of the solution partners in each area. Over time, software providers have developed and implemented best practices into their code which significantly boost users' corporate performance measured at year's end. Because there are endless varieties of corporate cultures and market environments, critical success factors will blend solution components in near-endless variety. The good news is that solution providers seem to be well-equipped to answer the challenges.

*—Mike Kalashian
Manager, HP's Manufacturing Industry Business Unit
(Cupertino, Calif.)*

baking of cookies. The fact that Rhythm includes what-if simulation capability enables planners to weigh multiple planning options.

Both the Factory Planner and capacity planning modules are supported on HP 9000 K-series servers. The solution also enables integration with Oracle GEMMS, Oracle's new transaction system and with other proprietary, legacy systems that were developed in-house and which are still required for business. Yet i2's Rhythm provides a single point of user contact to decision-making information.

Then again, consider Nestle, USA Inc. (Glendale, Calif.). Nestle aimed

to optimize its supply chain for all U.S. operations around its customers, integrating SCM and other critical business applications, including SAP R/3 for ERP. With several hundred products under dozens of brand names, the global corporation has an extensive supply chain. Freshness of its products drives the clock faster, perhaps, than for most other industries.

NESTLE'S MAKES THE VERY BEST

Logistics managers selected Manugistics 5. For such customer-centric businesses, SCM often proves to be the technology enabler. From business process reengineering incum-

bent to SCM solutions, a company can align business processes to best meet customer demands while streamlining and automating logistics and distribution and link these to other processes within the traditional ERP domain.

The approach connects the supply chain to customers in many ways. Not only does decision-support intelligence model "what-if?" scenarios and other advanced planning routines, these new systems can interface a promise-date with the scheduling and planning systems already being used elsewhere in the factory.

This means that manufacturing managers can schedule jobs with

EXTENDED-ERP/SCM PROVIDERS THAT HAVE ALLIANCES WITH HEWLETT-PACKARD

Advanced Supply Chain Planning & Scheduling

Company	Software	Description
i2 Technologies 909 E. Las Colinas Blvd. 16th Floor Irving, TX (214) 860-6000 i2.com	Rhythm	Rhythm encompasses the planning and scheduling of manufacturing and related logistics, including demand forecasting, raw materials procurement, work-in-process, distribution and transportation across multiple enterprises.
Manugistics Group, Inc. 2115 East Jefferson St. Rockville, MD (301) 984-5363 manugistics.com	Manugistics6	Manugistics6, the newest generation of Manugistics' supply chain optimization applications, is designed to help users anticipate customer needs, then orchestrate actions both within and across. Manugistics' suite is a component-based solution, integrated into the entire enterprise, specifically to optimize each of the key supply chain business processes.
Numetrix 655 Bay Street Suite 1200 Toronto, Canada (416) 979-7700 numetrix.com	Numetrix/3	Numetrix/3 can dynamically model business relationships which facilitates complete inter-enterprise collaboration. The Numetrix/xtr@ product supports this collaboration across the Internet.
SynQuest, Inc. 3500 Parkway Lane Suite 555 Norcross, GA (770) 447-8667 synquest.com	SynQuest Supply Chain Performance Series	The SynQuest Supply Chain Performance Series is a suite of products for optimizing and executing a competitive supply chain. Using the suite, managers design and deploy the best strategy for maximizing return on investment in plants, warehouses, inventories, transportation and other assets.
Logility 470 E. Paces Ferry Road Atlanta, GA (404) 261-9777 logility.com	Logility Value Chain Solutions	Logility's Value Chain Solutions (Demand Chain Voyager, Supply Chain Voyager, Demand Planning, Inventory Planning, Replenishment Planning, Event Planning, Transportation Planning and Management, WarehousePRO and Value Chain Designer) deliver collaborative planning and synchronization between demand opportunities, supply constraints and logistics operations.
Paragon Management Systems, Inc. 5933 W. Century Blvd. Suite 1220 Los Angeles, CA (310) 338-8444 paragonms.com	Paragon Applications Suite	Paragon Applications (Global Strategic Planner, Demand Planner, Global & Dynamic Scheduler and Real-time Event Real-time ATP, Supply Chain Planner, Material & Capacity Planner, Reactive Monitor) are designed for real-time production and inventory control, from the multi-plant/warehouse enterprise to shop floor operations.

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INTERNET TRIX

What happens for companies after working with Numetrix (Toronto, Ont., Can.) to streamline communications both inside and outside their corporations using the Internet? Studies in various industries show the importance of improvement to this particular aspect of supply-chain performance overall when trading partners can more accurately estimate

consumer demand and plan supply accordingly.

The Numetrix/3 solution was a prominent distribution logistics solution when Josef Schengili, Numetrix President, advanced the case for a more holistic view of enterprise solutions and extended supply chains in a published article, *Beyond the Walls of the Factory*, APICS Magazine, January 1996. Since then, barriers to progress that Schengili outlined have tumbled and corporate executives face various new challenges. Among these is the need to conduct business processes in real time, which fosters simultaneous network-wide collaborations among suppliers, production,

distribution and customers.

A case in point is the higher priority placed on programs in the agendas of corporate executives: real-time sales and operations planning (S&OP), vendor managed inventory (VMI/ECR), available-to-promise (ATP) and capable-to-promise (CTP). Prerequisite to these capabilities is access to up-to-the-second information passing across the supply/demand networks, both company WANs and the Internet.

This access requirement spells a new kind of SCM solution to support distributed datasets, local processing, real-time messaging and a high degree of configurability. "Here is a very

Enterprise Resource Planning

Company	Software	Description
BAAN Company Zonneoordlaan 17 6710 BG Ede, The Netherlands +31 318 696 6666 The Baan Company has dual headquarters in Barneveld, The Netherlands and Reston, Virginia, USA. baan.com	BAAN IV	BAAN IV is an integrated system of coordinated applications and tools supporting business processes in finance, production, distribution, transportation, service, maintenance, as well as administration of complex projects. It is suitable for both discrete manufacturing organizations as well as for the processing industry.
JD Edwards & Company One Technology Way Denver, CO 80237 (303) 334-4000 jdedwards.com	OneWorld	OneWorld provides multinational, integrated enterprise software for distribution, finance, human resources, manufacturing and supply chain management.
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complex environment," describes Schengili, "and we developed a distributed object messaging architecture (DOMA) specifically to enable all users in the supply/demand network to be able to work concurrently with real-time, synchronized data. The fact that this network is more and more frequently the Internet poses an important technological barrier, but this too is something we solve for corporations using Numetrix/xtr@."

What Numetrix calls true Collaborative Enterprise Networking (CEN) in its application increases the velocity of material and information flow through the supply chain. For the world's larger corporations, Nabisco and General Electric for example, data integration and velocity are exponentially critical.

Consider how SCM solutions incorporate Alert Lists. The process pushes messages about problems in the supply/demand chain to alert pre-specified users or groups in the company with authority or responsibility to deal with the problem. When problems are solved, the alerts disappear.

XTR@ STRENGTH

For larger companies, the problem with software using a traditional approach is that users are required to query the system and gather details about the problem. This can generate massive network traffic and force trouble-shooting activity to be done in batch mode. In contrast, these corporations that are using xtr@ "message-aware" software, can dynamically send and receive messages between users and systems so that users have real-time information updates and indications of problems to be addressed.

Integration is also an application requirement, especially for corporations with extensive investment in legacy database systems, many of which are distinct, autonomous systems. Numetrix, like other solutions providers, have supplemented their SCM solutions with tools. In Numetrix's case, the xtr@ solution needs to interface transparently with autonomous, non-xtr@ systems and the company developed Collaborative Enabler agents that are configured to

work with common supply-chain and ERP solutions. Each agent is pre-configured and installed on trading partners' machines, attaching itself to data subsets and enables the xtr@ application to monitor key planning information throughout the supply/demand network (and eliminating costly EDI-based alternatives).

MANAGERS IN THE KNOW

How does an IT manager know when the company is fully leveraging a supply-chain technology? You can invest in almost any SCM solution, but without accurately modeling the supply-chain environment and also allocating resources in an optimal configuration, "it's a bit like assembling a fine concert orchestra and expecting to hear great music without a conductor," says SynQuest's (Atlanta, GA.) Manager of Corporate Marketing Jamie Muir. The company has developed software for Fortune 1000 manufacturers to optimize financial performance from their supply chains and reduce total supply-chain operating costs on the order of 10% to 20%.

Viracon (Owatonna, Minn.), a fabricated glass manufacturer that supplies glass for 20- to 30-story high-rise buildings, expects to realize a 233% cumulative growth rate by the turn of the century. To meet that goal, the company is equipping itself with SynQuest software, running on a HP 9000 Enterprise Server, to increase glass production capacity by 25% without adding labor. "Manufacturing more than 25 million square feet of glass annually, which accounts for 60% to 65% of the architectural glass market, Viracon faces unique customer circumstances," observes Muir. Viracon's glass shines for visitors at the Rock and Roll Hall of Fame (Cleveland, Ohio) and Opryland Hotel (Nashville, Tenn.).

The company caters to construction engineers at high-rise building sites and, driven by widely variable circumstances, constantly needs to revise delivery dates. Bad weather at a site, for example, can force contractors to ask Viracon to delay delivery till the weather improves, by days or

weeks. But if construction is ahead of schedule, Viracon must be able to quickly reschedule manufacturing and enable delivery earlier than originally planned.

To improve Viracon's responsiveness, the SynQuest solution currently being deployed will specifically help company planners synchronize manufacturing activities. This is a flow-type environment, one in which the increased visibility and control of materials and work-in-progress, combined with production synchronization, are expected to support the company's aggressive goals for business growth.

Improved production capacity alone won't quite be enough, however. The job requires gaining share in a new market for medium-performance fabricated glass where time-to-market is critical and a supply-chain solution plays a fundamental role.

Viracon plans to launch a program using SynQuest to model manufacturing operations and optimize it for this new market. Even with the increased production volumes that are anticipated for the medium-performance glass market, Viracon's success with on-time customer shipments can be maintained through optimization with SynQuest — optimizing plans and schedules vs. just making feasible ones.

The SynQuest Supply Chain Performance Series helps define the optimum mix of sourcing, manufacturing and distribution and answers the questions "What should you sell and what could you sell, to make the most money?" One component, Manufacturing Management, combines advanced planning and scheduling with manufacturing execution for real-time control of operational activities. The advanced planning engine uses optimization that does not stop calculating at the first feasible plan or schedule, but continues processing until it calculates the best scenario.

Closing the gap between Supply-Chain Management and Enterprise Resource Planning has become a vital objective for IT managers — from hotel room chairs to chocolate chips — an all-encompassing strategy is crucial in a competitive environment. ♦

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Configuration Dissertation

IF YOU'RE COUNTING, this is the fourth article in my Ignite/UX series. And it's an Ignite/UX configuration overview. Previously, I discussed the creation of archive

images. This month I'll look into the structure and purpose of configuration files. These files control all aspects of Ignite/UX, from what appears in the GUI, to automating an Ignite session, to selecting and configuring the operating system loaded onto a client.

TOP DOWN CONFIGURATIONS

Starting at the top, configuration files serve several purposes:

- List active config files
- Name software configurations
- Select software components
- Describe install sources
- Describe software sets
- Define disk layouts
- Define configuration scripts
- Assign host identity
- Assign network information
- Set system values
- Set boot control parameters

The difficulty in working with configuration files is that there are typically at least five files used for every Ignite session. On top of that, some settings only have effects in certain files, or possibly mean different things when used in different files. Finally, you must carefully plan out your organization of configuration files, since many settings could be assigned in multiple files. If you fail to do that, things can get very confusing, very quickly. If you understand the overall organization of these files and when they're used, these issues can be managed.

Here's a look at the categories of configuration files and how they're

used.

System Defaults. In the directory `opt/ignite/data/Rel_<OSrelease>` there are several config files. These files are not to be edited, they are shipped with Ignite. Some of them, like the file named `config`, make good examples. Files that you create might override settings in these files.

System Specified. This category contains files that are shipped with Ignite/UX and those that are expected, but must be created or edited.

For starters, there is `/var/opt/ignite/INDEX`. This file will be edited — it's the master configuration file. All configuration files that you create must be referenced here, or they will be ignored. This is also the file in which you name software configurations and list the configuration files that define them. The actual information is in the listed files, not in the `INDEX` file. This is truly where you start configuring an Ignite software load.

Another file expected by Ignite is `/var/opt/ignite/config.local`. This is used to set defaults for this particular Ignite server and the clients that are to be installed from it. Think of it as globally applied local information. It contains information that controls Ignite sessions, as well as local network settings. It's more formally

known as the "local overrides" file and is typically listed last in any named configuration set in the `INDEX` file. It's not automatically read — it must be listed to be used.



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WE HAVE IGNITION

Every time a client is ignited, the Ignite server saves a copy of how that client was configured. This can be used during re-installs. The file, named `config`, will be created under the `/var/opt/ignite/clients` directory, in a sub-directory named after the MAC address of the client.

You can also create `config` files in this directory before a first Ignite session and use it to

assign the permanent IP address, hostname, and/or other client-specific information, such as which configuration to load. That would come in handy when using Ignite to deploy a new release in a network. Be forewarned though, this file is overwritten after every Ignite session for that host.

A file pivotal to performing hands-off installations is `/opt/ignite/boot/INSTALLFS`. This is the memory based file system that is downloaded to a client when a session is started. At first it would not appear to be a configuration file. Especially when you notice the pathname — it lives in the `/opt` directory. If you think about it though, you'll realize that there are some settings that control hardware, or the Ignite session itself, so the client must know about these before the actual installation begins.

A good example — you must set

the keyboard type in this file so that the session does not stop and prompt for it. Those chunks of data are loaded into the first 8KB of the INSTALLFS file so that they are available to the client when it reboots to the memory-based kernel and filesystem. You will use the command `instl_adm` to "poke" certain configuration information into the INSTALLFS file.

KNOW YOUR DEPOT

Finally, if you're using software depots, instead of, or in addition to archive loads, software in the depot must be made known to Ignite. This is done with files that are typically placed in the `/var/opt/ignite/data/Rel_<OSrelease>` directory. The command `make_config` can automatically create these files from a depot.

Archives also need to be described.

Those config files could be stored here, or in any directory you choose. Archive config files are commonly created by editing a copy of one of the supplied templates. Most people like to keep all hand-edited files lumped together for an easier backup.

User Specified. This third category of configuration files is where you perform the majority of your edits, control how an Ignite session runs and how clients are installed and configured. It is recommended that you store these files in `/var/opt/ignite/data/Rel_<OSrelease>`. The convention is to place `"_cfg"` at the end of the file name.

If all your hardware is similar and all hosts will be loaded with a similar software configuration, you might create only one file. You could end up with many files — it's up to you. Since there is a type of "if-then" statement in the syntax of configuration files, you

have an amount of dynamic decision making capability. That allows you to do quite a bit in one file.

If you're not concerned with setting up for hands-off installations, there is no need to create any User Specified files. The GUI based Ignite tools allow you to control sessions.

In fact, if you go through an Ignite installation manually, there is an option to save the configuration. That file can be used as the basis for creating your own automatic configuration files.

Next month we'll dive into the syntax used in configuration files and run through a few examples.

Are you still fired up over Ignite? Let Fred know at frederm@famece.com.

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Server Security Is A Snap-in

MICROSOFT'S HABIT is to release not only bug fixes in Service Packs, but new features as well. Service Pack 4 is no exception, addressing known security issues while adding a new feature

called the Security Configuration Manager (SCM).

SCM provides a single location to store all security-related settings for NT. Currently, to edit these settings, you need a variety of tools: User Manager for user accounts and groups; Server Manager for shares; and Explorer for individual file permissions. The SCM consolidates many settings onto a single set of screens, simplifying a complex procedure.



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SCM requires Internet Explorer 4.0 Service Pack 1 because it uses HTML. It's a snap-in for the Microsoft Management Console (MMC), Microsoft's extensible system management interface introduced in the NT Option Pack. MMC relies on snap-ins to add management functionality.

Get used to the MMC. It's the primary management interface for NT 2000. Since it supports third-party snap-ins, you'll be seeing more and more of it.

SCM follows the standard MMC scheme. By default, the scope pane contains two objects: Database and Configurations. The Database container shows the security configuration file and settings currently in use. The Configurations container lists ten Microsoft-supplied security configurations and stores any new configura-

tions.

Configurations are the real power of the SCM. You can create and save a configuration with preferred network settings in the SCM. As you deploy new systems, use the SCM command line version, `secedit.exe`, to apply the settings.

Configuration settings are organized into seven categories: Account Policies, Local Policies, Event Log, Restricted Groups, System Services, Registry and File System. Although this covers a lot, it helps to review them all in a single place.

The ten Microsoft-provided configuration templates are designed for machines playing various roles. For instance, domain controllers and workstations, with both basic and high security settings. It can be very instructive to review the differences between some of the configurations such as password policies on domain controllers configured for high or

basic security.

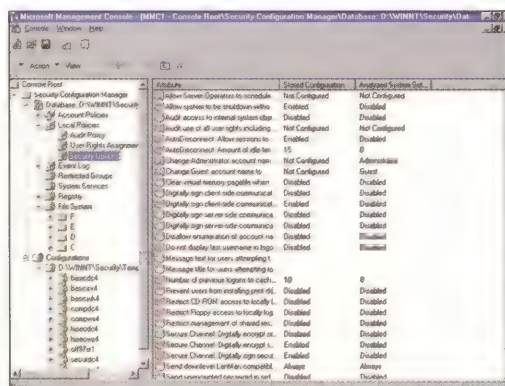
The only setting on the basic configuration is password expiration in 42 days. In the high security version, minimum password length, password history and complexity are all enforced.

SCM features an analysis tool that compares the security settings you configure with the actual settings for the machine. This analysis can be run from the MMC or from the command line. Using the command line, the analysis takes place at bootup; and the results can be e-mailed.

I like SCM, but there's room for improvement. Not every setting that can be configured is checked. TCP/IP filters can't be set and it won't check BIOS passwords or locked out diskettes. The analysis tool marks each setting not in compliance, but doesn't consolidate all the out of compliance setting on a single screen. You have to go through each screen looking for problems.

Service Pack 4 is available at www.microsoft.com/ntserver. The

SCM is an option and does not install automatically. It can be ftp'ed from ftp.microsoft.com/bussys/winnt/winnt-public/tools/SCM. ♦



The Security Configuration Manager in Service Pack 4 displays problems with the security settings for a 2000 Server.

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Working For The Benefit Of All

The HP 3000 Proves it's A-Live at Deserets Mutual Benefit Administrators

George A. Thompson

So called "venerable technologies" in the computer industry come and go so quickly that the words have since lost all meaning. So when a technology demonstrates not only staying power but manages to keep up-to-date, it's nothing short of astonishing. It's hard to think of another computer platform (now almost thirty years old) with that kind of longevity. Yes, with a zealous, some might say fanatical, installed base, the HP 3000 remains if not a cash cow for HP, something of a "sacred cow" for its dedicated, loyal users.

Just as the role of IBM's AS/400 within large corporations has been redefined in the sever-centric world at the end of the 20th century, the role of the HP 3000 has been redefined. But the HP 3000 has uniquely fulfilled its niche inside smaller- to medium-sized companies, especially since the demise of Digital Equipment.

SEMI-PRECIOUS PROCESSING

So, when IT managers speak of the HP 3000 as "running the crown jewels of their organization," it's not mere hyperbole. And that accurately describes the situation for David Lewis, CIO at Deseret Mutual Benefits Administrators (Salt Lake City, Utah), a health claims processing company, which has been in business for 22 years. "We've been an HP shop for at least ten," according to Lewis.

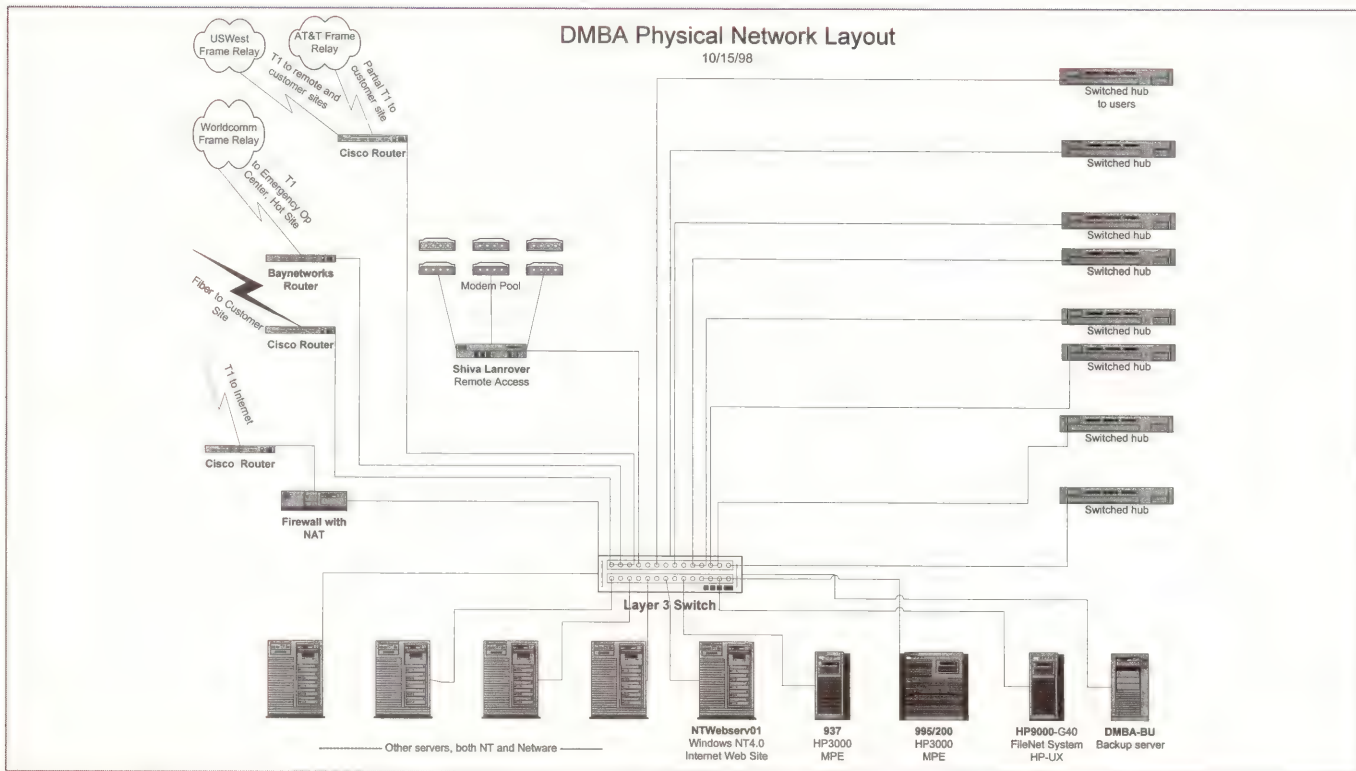
Deseret's overall configuration (see diagram on page 34) consists of a single HP 3000 995/200 running the production work and one HP 3000 937 which is used for development and testing. There are also Novell NetWare and NT LANs "generally running on Compaq hardware." Lewis also notes that "we have a HP 9000 G40 running a FileNet imaging application that maintains images of claims as well

as enrollment documents. But by far, it's the Amisys (acquired by healthcare information systems specialist, HBOC, in June, 1997) medical claims processing system on the HP 3000 that is the most precious jewel in the crown for Lewis. "It maintains the enrollment information for all of the participants [or clients] which we serve."

Processing a half-million claims a year, the HBOC/Amisys application runs on top of an Image database (native to the HP 3000). "It's a very solid database. We've never lost any data. We are very happy about that." And with good reason — the system holds information on 120,000 lives [or records], according to Lewis. But that's just the beginning of the story. Like every company these days, Lewis wanted to create a Web site for Deseret's participants. But unlike many existing corporate Web sites posting static information like corporate information, handbooks or explanations, Lewis emphasizes that the Deseret Web site (www.dmba.com) was not driven by marketing considerations. "We wanted to provide something that's going to go beyond that."

Deseret Mutual has three primary customer or client groups, explains Lewis. "First is the group of 'Employers,' the HR/Benefit departments of the companies we serve; the second group is the 'Insureds,' the participants in the benefit plan; and the third group are the 'Providers,' those that provide services, like hospitals and physicians. We wanted to address the needs of each group."

Early on, according to Lewis, there were three initial design objectives: 1. It had to operate on any browser. "We designed using HTML, for the lowest common denominator. We didn't want our Insureds who were dialing in from home to have a certain level of browser to have functionality. 2. Fast load times. "Many of the Insureds [use]



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modems, so we designed with minimal, but hopefully pleasing, graphics" 3. Direct access to the LIVE data. "This was the issue at stake for HP 3000 and Image database."

But Lewis faced an all too common problem: in Web environments, there were not very many tools available to access data in Image, a flat file database. "They were just not as available as those for Oracle, Sybase and SQL Server." However, Lewis didn't want to do what many others have already done when faced with providing access to production data — take an extracted subset of the production data, put it into a data warehouse and point their Web access tools to that subset.

ALTERNATIVE ACCESS

After looking at "several alternatives," Lewis chose M.B. Foster's Data Express with ODBCLink. ODBCLink provides direct access to Deseret's Image database. "We've designed the Web page to go straight to the live Image data. For instance, if the processor has just finished processing my medical claim five minutes ago, I look up the status of the claim, and I immediately see whether its paid or tagged for further information.

But Lewis stresses that the HP 3000 *is not the Web server*, which actually consists of Microsoft NT 4.0 running Internet Information Server (IIS) 4.0. A "listener" portion of ODBCLink software, running on the HP 3000, works together with its client equivalent, running on the NT server, according to Doug Jepson, Webmaster at Deseret.

The Web site has been operating since March 1998, "with several pieces of functionality added since then," says Lewis. "Most of the useable things are behind a secure screen which requires a social security number and personal identification number (PIN)."

This gives all of Deseret's "Insureds" secure access to their medical files 24 hours a day as well as an opportunity to submit e-mail questions to customer service representa-

tives. Previously, customers would call a customer service rep (a service that's still offered).

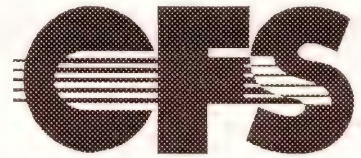
Although associated costs of Deseret's Interactive Voice Response System are expected to decrease over time, e-mail volume (as of early December) has not been especially high compared to hundreds of phone calls that are still received. But the site is still relatively new with an "ongoing shakeout still in progress. When [volume] got too high, we had some concerns about the ODBCLink."

VOLUMINOUS STRESS

Regarding the volume, Lewis admits that stress testing tools on the server revealed the difficulties, specifically when multithreading accesses to the database. And, Lewis also points out; "there were problems with IIS server too." But those problems have since been resolved to his satisfaction. Now Lewis and his team are thinking about the future.

"We anticipate doing more; [for example], an Employer would be able to look at eligibility information for their own employees. They are currently able to look up premium rates based upon a set of codes and criteria. Another area is for the Providers, where they can check patient availability by entering the patient or contract holder's social security number and date-of-birth of the insured or one of the dependents and we will relay what kind of coverage that individual has."

Because of the uptime requirements of their business, Lewis maintains an emergency operations center in West Jordan, Utah, which is 20 miles away from the Salt Lake headquarters. "Currently, we have a contract with HP for recovery processing (on an HP 3000) using HP's facility in Seattle, Washington. If we have problems, we can take it there using the HP 3000." Asked, if there was ever a need for disaster recovery, Lewis says, "We've not had to execute during a disaster, but we [do run tests] and it all works great." ♦



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DATA WAREHOUSING

Vista Plus For SAP R/3

The Vista Plus Interface for SAP R/3 tracks and updates user and group profiles, folder hierarchies, report tree modifications and security authorizations which reduces the risk of errors in entering user and security profiles. The integration module uses the native SAP R/3 job scheduler and eliminates any risk of negatively impacting the SAP R/3 environment.

Users can launch the Vista Plus Windows client from within the SAP R/3 interface and through the Java client, SAP R/3 report data is available under the same security rights and privileges for remote users over the LAN or Internet.

Contact Quest Software, Newport Beach, CA at (949) 720-1434.

DESKTOPS AND SERVERS

Compaq ProLiant 6500

The Compaq ProLiant 6500 uses the 400 MHz Pentium II Xeon processor. It can be rack mounted with the 7U form factor, allowing up to six units to be stacked in a standard 42U rack and providing the computing power of up to 24 Pentium II Xeon processors in less than 2.5 square feet of floor space. It includes PCI Hot Plug technology which allows to power on or off individual PCI slots or replace PCI boards without having to take the server offline.

It supports up to four processors with 512K or 1024K L2 Cache, up to 4GB of ECC-buffered EDO memory and dual-peer 64-bit buses. It starts at \$12,784.

Contact Compaq Computer Corp., Houston, TX at (800) OK-COMPAQ.

DISASTER RECOVERY AND SECURITY

Encryption Plus 5.1 For Hard Disks

Eplus-Hard Disk offers automatic data protection with centralized administration. Version 5.1 features the Administrator Wizard that allows administrators to create User Install disks and One-Time Password programs for hard drive encryption within a corporate environment.

It also has a Local Administrator for different local passwords for different installations or locations and the Auto Install feature that allows an administrator to manage hard drive encryption over the network. It uses the Blowfish algorithm with a 64-bit cipher. A 160-bit version is available in the U.S. and Canada. It sells for \$99.95 for single user copies with quantity discounts available.

Contact PC Guardian, San Rafael, CA at (800) 288-8126.

E-COMMERCE

NetAgent TM 2.0

eShare Inc.'s NetAgent TM 2.0 acts as a communications conduit between suppliers and their customers by providing real-time dialog capabilities that automate Web-based commerce, customer support and service. New features include e-mail support, customer observation capabilities and APIs that integrate with leading knowledge-based engines.

Agents can observe and log live visitor activity and engage in real-time discussions. The e-mail support module allows agents to manage customer e-mails by tracking and grouping them with incident ID numbers and API support lets users tap into their installed knowledge-bases without having to re-build any data. NetAgent TM 2.0 supports any browser and uses SSL security encryption.

Contact eShare Technologies, Commack, NY at (888) 374-2734.

MESSAGING AND E-MAIL

Net SatisfAXtion 6.2

Net Satisfaxtion 6.2 integrates a stand-alone fax machine as a client with the Net Satisfaxtion fax server for control and capture of all faxes. No separate box is required as an interface between the fax machine and the fax server. It is designed to communicate directly with the fax machine over standard phone lines.

Features include: e-mail enable any fax machine; central log of incoming and outgoing faxes; track fax machine usage by sender or department for billing; on-the-

fly cover page generation; fax broadcast from fax machine; automatic sender notification; fax authorization system; and Y2K compliance for fax machines.

Contact FaxBack, Inc., Tigard, OR at (503) 614-5399.

NETWORK INTEGRATION

MultiView 2000

MultiView 2000 4.0 is a 32-bit applications that gives UNIX-based character terminals a graphical face-lift with on-the-fly Windows look-and-feel, integration into corporate intranets and no re-programming.

New features in 4.0 include: central administration for software installation, maintenance and upgrade; integrated multimedia support which provides UNIX applications with image, sound and speech capabilities; and face-lifting which provides high-level Windows look-and-feel enhancements including page dependent toolbars and pop-up menus, text substitution and Windows message boxes.

It starts at \$199 for a single user license.

Contact JSB Corporation, Scotts Valley, CA at (408) 438-8300.

STORAGE

HTML Jukebox Management

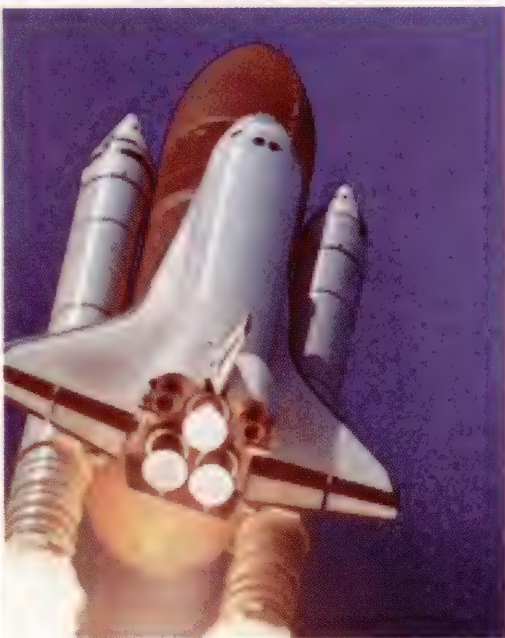
Tracer Technologies has released V221 of HTML-based jukebox management software for UNIX workstations. The new release includes AIT and DLT tape support, automatic data migration to CD-R and support for DVD-ROM and DVD-RAM. It also includes a Web-enabled and a point-and-click GUI.

The Migration Toolkit automatically migrates host data from a magnetic file system to CD-R, rewriteable MO, write-once optical and AIT or DLT tapes based on user-definable parameters. It allows the user to specify any migration schema from HyperMAN-II html interface, from command line, scripts, or API.

Contact Tracer Technologies, Inc., Gaithersburg, MD at (301) 721-2800.

PowerStor L200 DLT

ATL Products has announced the PowerStor L200 Automated DLTape Library for lower capacity UNIX and NT LAN backup applications. Priced to compete with desktop tape products, the PowerStor L200 delivers "lights-out backup" with robotics cartridge handling when used with data management software. It



Ready to Change Course?

The IT industry is constantly changing and reinventing itself, creating new job opportunities along the way. Are you ready to discover some of the new careers available in the market? Well Infoworld Enterprise Solutions has positions available to help you chart a course that takes advantage of the latest technologies.

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We're looking for an energetic individual to build our new ERP Practice from the ground up into a thriving segment of our company's business. In addition to leading the practice, this individual will be responsible for generating new business and hiring specialists to implement ERP solutions. Qualified candidates will have a bachelor's degree with 6 years application consulting experience or equivalent.

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Applicants must be ready to gather and design business requirements within the functional areas of manufacturing or distribution/retail for mapping to an ERP application. Candidates will also develop new business opportunities for additional services and products in cooperation with a sales representative. Ideal candidates will have a 4 year degree and 2+ years of related business experience or equivalent.

Manager, E-Commerce Practice

Do you understand all the complexities involved with the ever-expanding E-commerce market? Than you might be the individual we're seeking to lead our emerging Electronic Commerce Practice. The individual hired for this position will be responsible for building the practice, generating business, and hiring consultants to deliver E-commerce solutions. Qualified candidates will have a bachelor's degree with 4 years technical consulting experience or equivalent.

High Availability Consultants

Will analyze client requirements, provide technical support, and lead other consultants in design and implementation of appropriate solutions using HP High Availability, HP UNIX, and HP OpenView solutions. Experience with EMC storage and backup solutions is a plus. Ideal candidates will have a bachelor's degree with 4 years technical consulting experience or equivalent.

How to Respond...

Send resumes to HR Director/CM, 6480 Rockside Woods Blvd., S., #190; Independence, OH 44131---or fax to 216-901-1447---or e-mail to jobs@iwes.com. To learn more about these and other exciting career opportunities available at Infoworld Enterprise Solutions, visit us online at www.iwes.com.



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features one DLT4000 or DLT7000 tape drive and 8 cartridge slots for a native performance up to 18 gigabytes per hour and a native storage capacity up to 280 gigabytes.

For both tabletop and rackmount configurations, two PowerStor L200's can be rack mounted side-by-side to fit within a standard 19-inch cabinet.

Contact ATL Products, Irvine, CA at (800) 677-6268.

SYSTEM AND NETWORK MANAGEMENT

Night Vision

Night Vision checks the status of network servers and takes a pre-defined course of action if a device does not respond. It can provide a visual warning, send an E-mail message, page the system administrator, or execute a program. Night Vision can monitor any TCP/IP device such as Web servers, file servers and routers.

The administrator does not need to check servers manually, so administrative overhead is reduced. Downtime and user satisfaction are improved by prompt response to server failures. Finally, standardized procedures improve quality of service. Suggested list price is \$295.

Contact J. River, Inc., Minneapolis, MN at (612) 677-8200.

WORKFLOW AND DOCUMENT MANAGEMENT

StreamServe's BaanCAPPS Certification

The Baan Company's Certified Applications Provider Program (BaanCAPPS) certification for StreamServe ensures compatibility with the Baan IV

applications. The StreamServe Connectivity Pack for Baan integrates with Baan IV and creates and maintains customized output and documents for business-essential processes such as order confirmation, shipping, invoicing and procurement.

The resulting output can be provided in print-ready form, such as PostScript, AFPDS or PCL5 format, and then printed and/or converted to PDF, HTML or XML documents, e-mailed, faxed or distributed for further processing by third-party solutions such as EDI translators or output delivery and distribution environments.

Contact StreamServe Inc., Raleigh, NC at (919) 845-9711.

YEAR 2000

Millennium Key

RMM, Inc. has announced Millennium Key, a JAVA-based Year 2000 code assessment, validation and remediation tool incorporating a patented universal programmer's workbench approach. It coordinates remediation across mainframe, enterprise and desktop applications and environments.

The tool incorporates RMM's patented spanning and bridging technology: Spanning increases the span of the century window by up to 65,000 years; Bridging combines "expansion" and "windowing" fixes, utilizing "virtual expansion" (compression) for all existing recorded data and "real expansion" for all new information.

The PC version is \$2,000 single user; \$15,995 ten-user license; \$29,875 25-user license; additional users added at \$995. The Internet version is \$249.

Contact RMM, Inc., Colombia, MD at (410) 730-8118. ♦

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APPLICATION DEVELOPMENT

Java Development Kit

HP will ship products with the next release of Sun Microsystems, Inc.'s Java Development Kit (JDK version 1.2) running on HP-UX 10.20 and HP-UX 11. In addition to licensing Sun's Java HotSpot Virtual Machine, HP will introduce native and Just-In-Time (JIT) compiler enhancements to the base JDK version 1.2 technology. HP will offer developers early access to product shipments in the first quarter of 1999 with full availability by mid-1999.

url: www.hp.com/go/java

HP's Call To Action

HP is supporting J.D. Edwards' "Idea to Action" — a product strategy and solution that addresses customers' concerns over post-implementation rigidity in enterprise application software — and ActivEra, a suite of products and technologies that enable "Idea to Action." HP provides a range of platforms for running J.D. Edwards' applications, from NT-based NetServer systems to HP-UX-based HP 9000 servers running MC/ServiceGuard.

url: www.jdedwards.com

Business Intelligence And Data Warehouse

HP is combining the HP OpenWarehouse program with HP Consulting and partner offerings to release: an ERP Business-Intelligence program, which will initially include a set of data-warehouse methodologies, technologies and services and support for SAP BW; customer-relationship-management solutions for financial services to allow customers to fine-tune marketing effectiveness and improve customer interaction; and a complete call-behavior-analysis product for the telecommunications market with telco-specific extract technology, data models, methodology and architecture.

HP and Oracle also announced an initiative including joint sales, marketing, research and development for customers requiring multiterabyte, business-critical data warehouses. HP and Informix are planning a certified data warehouse — a pretested and preconfigured business-intelligence solution across Windows NT and HP-UX platforms.

url: www.hp.com/go/datacenter

SERVERS

New High-End UNIX Server

The HP 9000 V2500 server is a high-end PA-8500 RISC UNIX system targeted for technical computing customers who require a scalable, high-performance machine. Scalable up to a 128-way configuration, it is for large engineering environments running multiple scientific and engineering applications, such as electronic design analysis, mechanical design analysis and product data management. The V2500 delivers more than 55 gigaflops in a 64-way configuration of a Linpack NxN application and in a 32-way configuration, it delivers more than 7,249 SPECint rate 95. The 128-way configuration is expected to be available in mid-1999.

url: www.hp.com/go/datacenter

SERVICES

Domino Messaging

Lotus Development Corporation and HP will offer a complete, easy-to-purchase and -deploy messaging migration solution. This offering includes all the software, hardware and services needed to migrate to the Lotus Domino messaging platform. Lotus and HP have worked together to develop a pre-tested, pre-configured solution that optimizes the strengths of Domino on the HP NetServer system, and gives partners and their customers the opportunity to streamline the migration process. Lotus and HP are targeting Channel Partners who have expertise in messaging migration for Domino and the NetServer platforms.

url: www.hplotussolutions.com

STORAGE

HP MO Jukeboxes Gets Panagon

HP has integrated its 5.2GB-based (8X) magneto-optical (MO) jukeboxes with FileNET's software, Panagon Integrated Document Management Image Services (IDM IS) 3.4.2. The new product supports 8X MO jukeboxes by reading and writing 8X media with 2K sectors. Panagon stores, manages and retrieves information of all types from many sources. It can manage high document volumes, ranging from 20,000 documents per day to upwards of half a million documents per day.

url: www.hp.com/storage

WORKSTATIONS

AutoConfigure

HP will offer PLATINUM technology Inc.'s AutoConfigure software for HP Vectra and NetVectra PCs. Based on Wired for Management specification, PLATINUM's AutoConfigure software, coupled with HP Vectra and NetVectra PCs, enables IS managers to centrally configure PCs, deploy operating systems and applications, format hard-disk drives and install management agents such as HP TopTools.

url: www.hp.com/desktop

Model C360 Workstation

HP's new performance standard for power-desktop UNIX system workstations is the HP VISUALIZE Model C360. In 3-D graphics benchmarks, the new system, configured with HP VISUALIZE fx6 graphics, scored 1007 PLBsurf — the industry's first score greater than 1,000. The Model C360 surpasses a comparably configured Sun Ultra60/360 from Sun Microsystems on all industry-standard ViewPerf benchmarks.

url: www.hp.com/go/technical

Kayak For Traders

On the Kayak NT Workstation for traders, HP teamed with Matrox and PixelVision to offer a complete line of multi-monitor and flat-panel displays. The PixelVision system can merge video windows from multiple computer sources, including Sun workstations and dedicated PCs, such as EBS, Reuters Dealing or IDB (interdealer broker) screens, into a single display.

url: www.hp.com/go/kayak

“We have 9 companies running MK Group solutions. Their software is bulletproof.”



—Terry Simpkins, Director, ISIT
Lucas Control Systems

Lucas Control Systems is a \$100+ million manufacturing company that was built by acquisition. This, of course, presented the company's Director of Information Systems and Technologies, Terry Simpkins, with an information systems nightmare. "Our 7 manufacturing locations were using 5 platforms, 6 MRP solutions, 6 general ledger solutions and 6 order processing systems." ● Some of the systems were no longer supported. Others could not cope with the Year 2000 problem. What's more, the company intends to triple in size in the next few years. Clearly, Terry Simpkins needed to standardize on a single, robust, scalable and flexible system. ● He found it in the MANMAN[®] integrated manufacturing management software from MK Group, an

independent business unit of Computer Associates International, Inc. The software runs on the HP 3000 platform.

● MANMAN and MK Group had both proven themselves to Terry Simpkins over the years. "We are very satisfied with MANMAN and MK Group. Their solutions have always given us the flexibility, robustness, support and future options we needed. They handle multiple currencies and they're Year 2000 compliant. And our HP 3000 system defines the word reliability. Staying with MK Group and Hewlett-Packard as we grow will save us millions in total cost of ownership."

● The cost savings with MK Group were expected. But the real benefits, according to Terry Simpkins, are the "increased functionality, improved business integration and better information management." ● Find out for yourself what Lucas Control Systems has proven. You can't beat the powerful, bulletproof



software and total customer support of MK Group. Contact MK Group at

1-800-407-8686 or visit www.mkgroup.com for a free videotape case history of

Lucas Control Systems' experience with MK Group and Hewlett-Packard.



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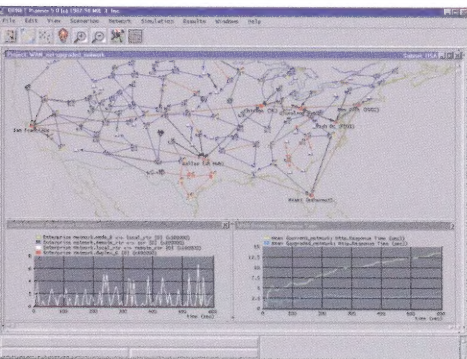
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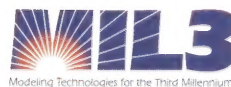
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